Veolia Fenn's Bank IVC facility

Information to inform Habitats Regulations Assessment

Version 1.0

Prepared for Axis Ltd.

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Version 1.0 / Ref. K26-001

03/02/2026

Unit 14 The Greenhouse Greencroft Industrial Park
Annfield Plain County Durham DH9 7XN

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Report Reference	Ref. K26-001
Date	03/02/2026
Date of survey/s	12/08/2025

Issue	**Prepared by**	**Status**	**Date**
V1	Kevin Barry Honour MSc MCIEEM	FINAL	03/02/2026

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1 Introduction

1.1 Aims and objectives

This document provides information to inform a Habitats Regulations Assessment ('HRA Report') for an In-Vessel Composting Facility (the 'Proposed Development'), located at the former Befesa Salt Slags site, Fenns Bank, Wrexham.

The purpose of the HRA Report is to provide sufficient information on the predicted impacts of the Proposed Development to enable the Competent Authority, Wrexham Council, to undertake a Habitats Regulations Assessment under Regulation 63 of the Conservation of Habitats and Species Regulations 2017 (as amended).

The primary aim is to provide information to assist the Competent Authority to determine whether the proposed project would have a likely significant effect on European conservation sites, either alone or in combination with other plans or projects. This is equivalent to the requirements of Stage 1 of the HRA process, following the procedures set out in European and current national guidance, and is referred to in Wales as a Test of Likely Significant Effect (TLSE).

Any possible effects which cannot be screened out at Stage 1 are then subject to an Appropriate Assessment (Stage 2 HRA) of the implications of the plan or project for the European sites, in view of the site's Conservation Objectives, in order to determine whether there will be an effect on the site's integrity.

1.2 Structure of Report

The HRA report has the following structure:

- Section 2 considers the HRA process, including legislation and associated case law;
- Section 3 describes the qualifying feature of relevant European sites, and considers their condition and sensitivity;
- Section 4 describes the Proposed Development, making reference to evidence set out in the *Planning Design and Access Statement* (PDAS)[1] and relevant technical reports;

[1] Axis Ltd. (2025). *Proposed Development of an In-Vessel Composting (IVC) Facility, Former Befesa Salt Slags Site, Fenns Bank, Wrexham – Fenn's Bank IVC*. *Planning Design and Access Statement*. Ref. 5039-01-PDAS-07. September 2025.

- Section 5 carries out a test of likely significant effect, screening the potential effects of the Proposed Development with reference to the supporting evidence outlined in the previous section; Section 6 considers if any likely significant effects could have an effect on the integrity of a European site, having regard for any mitigation measures, in order to assist the Competent Authority in producing an Appropriate Assessment.

1.3 Evidence Base

The HRA Report relies principally on the following documents to inform the assessment:

- Axis Ltd.: *PDAS* (referenced above);
- Fichtner Consulting Engineers: *Air Quality Assessment* (AQA)[2];
- Fichtner Consulting Engineers: *Air Quality Assessment Addendum - Planning*[3];
- Waterco Limited: *Drainage Strategy*[4]; and
- K.B. Honour: *Ecological Interpretation of Air Quality Assessment*[5].

The document has been compiled having regard to Pre-Application Consultation advice from Natural Resources Wales[6], and subsequent mitigation measures incorporated into the Proposed Development to address potential impacts on European and Ramsar Sites.

[2] Fichtner Consulting Engineers (2026). *Shropshire In-Vessel Composting Facility. Air Quality Assessment*. Revision 3, 23/01/2026
[3] Fichtner Consulting Engineers (2026). *Shropshire In-Vessel Composting Facility. Air Quality Assessment Addendum - Planning*.
[4] Waterco Limited (2025). *Former Befesa Salt Slag Site. Drainage Strategy*. Version 04, 03/01/2026
[5] Honour, K.B. (2025) *Veolia Fenn's Bank IVC Facility. Ecological Interpretation of Air Quality Assessment.* Version 2, 29/01/2026
[6] Natural Resources Wales. *Statutory Pre-Application Consultation - Proposed Development of an In-Vessel Composting Facility at the former Befesa Salt Slags Site.* Letter to Axis Ltd. ref. CAS-289730-K2Y6, 14/11/2025

2 The Habitats Regulations Assessment Process

2.1 Regulatory basis of HRA

Until 31 December 2020, the HRA process was underpinned by the EU Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna), and the provisions set out in Article 6(3) and 6(4). Wetlands of international importance listed under the 1971 Ramsar Convention are not subject to the same provisions in European law, but in England listed or proposed Ramsar sites are given the same protection as European ('habitat') sites under paragraph 176 of the National Planning Policy Framework (NPPF).

After the end of the EU exit transition period the UK is no longer bound by the Habitats and Wild Birds Directives; however, the Conservation of Natural Habitats and Species Regulations 2017 (as amended) (the 'Habitats Regulations') continues to apply, together with relevant Court of Justice of the European Union (CJEU) judgements made before that date. The UK remains a signatory to the Ramsar Convention, so the application of the HRA process to Ramsar sites will also continue.

The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019[7] were designed to enable the UK to continue to meet its international commitments, such as the Berne and Bonn conventions, and ensure that regulations transposing the EU Habitats and Wild Birds Directives are operable, by making amendments to the Habitats Regulations and other instruments which transpose the Directives into UK law.

Regulation 63 (1) of the Habitats Regulations states: '*A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which-*

(a) is likely to have a significant effect on a European site or a European offshore marine site (either alone or in combination with other plans or projects), and

(b) is not directly connected with or necessary to the management of the site, must make an appropriate assessment of the implications for the site in view of that site's conservation objectives.

[7] https://www.legislation.gov.uk/ukdsi/2019/9780111179512/contents

2.2 Stages of HRA Process

It has been established that the assessment requirements under Article 6 of the Habitats Directive require a stage-by-stage approach, as set out in guidance by the European Commission (2001). These can most simply be categorised as follows:

- Stage 1: determination of likely significant effect;
- Stage 2: Appropriate Assessment to determine effect on site integrity;
- Stage 3: Consideration of alternatives; and
- Stage 4: Consideration of imperative reasons of over-riding public interest, and compensation measures.

This HRA report provides information to the Competent Authority equivalent to a Stage 2 assessment. It is structured and guided with the assistance of the *Habitats Regulations Handbook*[8], including recommendations arising from current case law. It includes a description of European sites and their Conservation Objectives, followed by consideration of their sensitivity. Potential effects are identified, with identification of likely significant effects in accordance with the Waddenzee principles[9], then providing information to inform an Appropriate Assessment.

2.3 Implications of relevant case law

'Waddenzee'

Identification of likely significant effects in the Stage 1 assessment is carried out in accordance with the Waddenzee principles[10], interpreting a 'likely' effect as a 'possible' effect, identified in the light of the best available scientific knowledge.

Sweetman

The Advocate General of Ireland further clarified the meaning of 'significant'[11] as follows: *'48. The requirement that the effect in question be 'significant' exists in order to lay down a de minimis threshold. Plans or projects that have no appreciable effect on the site are thereby excluded. If all plans and projects capable of having any effect*

[8] Tyldesley, D. & Chapman, C. (2013). *The Habitat Regulations Handbook*, DTA Publications Limited
[9] ECJ Case C-127/02, *Landelijke Vereniging tot Behoud van de Waddenzee*, 7th September 2004.
[10] ECJ Case C-127/02, *Landelijke Vereniging tot Behoud van de Waddenzee*, 7th September 2004.
[11] ECJ Case C-258/11 Preliminary ruling from the Supreme Court of Ireland, Peter Sweetman Ireland Attorney General, Minister for the Environment, Heritage and Local Government vs. An Bord Pleanála 11 April 2013 (together with the opinion of the Advocate General delivered on 22 November 2012)

whatsoever on the site were to be caught by Article 6(3), activities on or near the site would risk being impossible by reason of legislative overkill.'

'People over Wind'

On 12 April 2018 the CJEU delivered its judgment on the case of *People over Wind, Peter Sweetman v Coillte Teoranta*[12]. This ruling has changed the extent to which HRA screening assessments can consider incorporated mitigation measures and lowers the threshold for moving on to an Appropriate Assessment (HRA Stage Two).

The *People over Wind* judgment ruled that '*it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site*'[13]. The context of this was a legal challenge in the Irish High Court to an Appropriate Assessment screening assessment (equivalent to Stage 1 HRA screening in England) of a grid connection cable from a wind farm, and possible effects of siltation on the qualifying interests of the River Barrow and River Nore SAC[14]. The key qualifying feature of the SAC, Nore freshwater pearl mussel (*Margaritifera durrovensis*) is both very rare and very sensitive to sediment inputs.

The *People over Wind* judgment has been interpreted by PINS Note 05/2018[15]. This advice explicitly states (para. 17) that the definition includes 'embedded' mitigation. However, the same paragraph also notes that the Judgment does not define what constitutes avoidance or reduction measures, and what could be regarded as an integral part of a development proposal. In addition, paragraph 14 notes that it is not necessary to proceed to Appropriate Assessment where no effect pathway has been identified.

Recent judgements have clarified the interpretation of 'incorporated mitigation' as tending to exclude measures which would have been required irrespective of the presence of a Natura 2000 site, as a requirement to comply with other legislative or policy requirements[16].

[12] ECJ Case C-323/17, *REQUEST for a preliminary ruling under Article 267 TFEU from the High Court (Ireland), made by decision of 10 May 2017, received at the Court on 30 May 2017, in the proceedings People Over Wind, Peter Sweetman v Coillte Teoranta*
[13] ECJ Case C-323/17, *op. cit*.
[14] Tyldesley, D. & Chapman, C. (2018). People Over Wind – the Story behind the Case. *Habitat Regulations Assessment Journal,* **10**, 8-13.
[15] The Planning Inspectorate. PINS note 05/2018. *Consideration of avoidance and reduction measures in Habitats Regulations Assessment: People over Wind, Peter Sweetman v Coillte Teoranta*. 09 May 2018.
[16] Tyldesley, D. (2019). Mitigation Measures in the UK and Irish Courts post *People Over Wind*. *Habitat Regulations Assessment Journal*, **12**, 29-34.

The Wealden Judgement

The Wealden Judgement[17] concerned a case where a local plan (the Lewes Joint Core Strategy (JCS)) had screened out effects of vehicle emissions along the A26 road on a European site (Ashdown Forest SAC), concluding no likely significant effect. Predicted traffic generation was below the screening threshold of 1000 annual average daily traffic movements (AADT). The JCS had not considered the in-combination effects of traffic resulting from policies of the Wealden Core Strategy, which was predicted to generate 950 AADT along the same section of road.

The effect of the judgement was a requirement to apply in-combination effects at HRA screening stage, at least with respect to traffic growth arising from local plan policies. For point-source discharges, the 1% process contribution (PC) threshold has usually continued to be regarded as *de minimis* in England and Wales in accordance with Air Quality Technical Advisory Group (AQTAG) advice[18]. However, IAQM (2019) guidance[19] cautions that this has not been revised since *Wealden*, and the advice of the relevant statutory agency should be sought.

The Netherlands Ammonia Cases

A CJEU judgement on joined cases C-293/17 and C-294/17 was handed down on 07 November 2018 (the 'Netherlands Ammonia Cases'). Although principally concerned with the treatment of agricultural activities which contribute to elevated ammonia levels and nitrogen deposition on European sites, a subsequent legal analysis published in July 2019[20] suggests that this may have wider implications for other projects involving additional nitrogen deposition. In particular, the ruling highlights issues with permitting even small increases in nitrogen deposition in habitats where baseline conditions exceed the relevant critical loads, and which are currently in unfavourable condition. The author of the legal review suggests that the judgement may have implications for current UK guidance and practice in assessing the effects on European sites where background levels and deposition rates exceed the relevant environmental quality standard.

[17] Judgment in Wealden District Council v Secretary of State for Communities and Local Government, Lewes District Council and South Downs National Park Authority) [2017] EWHC 351 (Admin)
[18] Air Quality Technical Advisory Group, AQTAG21, 'Likely significant effect' – use of 1% and 4% long-term thresholds and 10% short -term threshold, Updated version approved 2 October 2015
[19] Holman *et al* (2019), *op. cit.*
[20] Machin, G. (2019). The Netherlands Ammonia Case – a nettle half grasped. *Habitat Regulations Assessment Journal,* **12**, 10-19.

The consequences of the 'Netherlands Ammonia Case' for the assessment of pollutant effects on European sites include a need to:

- Give due weight to the condition of the relevant site unit;
- Give due weight to the extent to which background air quality is identified as contributing to current site condition (e.g. in NRW's Site Improvement Plans and Supplementary Advice for Conservation Objectives);
- Avoid the justification that small magnitude increments in circumstances where background levels are exceeded are unlikely to have a significant effect, unless there are sound ecological reasons for doing so; and
- In cases where background levels are exceeded, consider whether existing and proposed mitigation measures aimed at reducing emissions provide sufficient evidence that 'headroom' will be created to allow an additional emission source.

EC vs Germany (the Moorburg case)

This case[21] concerned a lack of consideration of the cumulative effect of existing projects and licensed processes in the assessment of a new project. The context was the construction of a new coal-fired power station, with potential impacts on migratory fish populations due to cooling water intake and discharge. The project was found to have failed to consider the ongoing cumulative effects of an existing pumped storage power plant on the same river, or the in-combination effects of a possible hydro-electric power scheme which was already in the planning system.

Guidance relating to this judgement[22] suggests that existing environmental conditions and the factors responsible for them are taken into account in the assessment of effects. It may not be necessary to consider all such effects, but some will be necessary to consider either as part of the baseline conditions, or as an in-combination effect.

This assessment sought to conform to this judgement by giving due weight to existing environmental pressures, including those resulting from unlicensed activities, with respect to both water quality and air quality.

[21] Case C142/16 *European Commission vs Federal Republic of Germany*. Judgement of the Court (Second Chamber) of 26 April 2017. https://curia.europa.eu/juris/liste.jsf?num=C-142/16

[22] Tyldesley, D. (2017). The Moorburg Power Plant Case - A closer analysis of CJEU Case C-142/16. *Habitats Regulations Assessment Journal*, **7**, 10-14.

3 European and Ramsar Sites

3.1 Sites considered in HRA Report

Sites within Zone of Influence of the Proposed Development

The Zone of Influence (ZoI) can be defined by the scale, duration and extent of likely impacts of the Proposed Development.

For point-source emissions to air, Environment Agency guidance defines the following radii for consideration of effects on sensitive ecological receptors:

- 2km from emission source for Sites of Special Scientific Interest (SSSI), locally designated sites and ancient woodlands; and
- 10km from emission source for European conservation sites and Ramsar sites.

For traffic emissions, a 200m buffer from roads is used to identify any potentially affected designated sites.

For emissions to surface water, it is appropriate to consider effects on European sites downstream, having regard for catchment-scale effects; consideration is also needed of groundwater bodies and aquifers.

The appropriate ZoIs for all potential impacts can be summarised as follows:

Table 3.1: Zones of Influence for potential impacts

Potential effect	Distance	Rationale
Land-take	0m	ZoI defined by planning application boundary, including any related works covered in application (e.g. grid connection, sewer / surface water connections)
Loss of functionally linked land	0m	As above; functionally linked land defined as land outside (usually) SPA and Ramsar sites, used by significant numbers SPA and Ramsar site features (e.g. high tide roost sites close to estuaries)
Emissions to air - dust	50m	IAQM screening criteria[23] for dust emissions to ecological receptors - 50m from site boundary, and 50m from access roads within 250m of site.
Emissions to air - stack emissions	10km	Defined by Environment Agency's air emissions risk assessment for your environmental permit

[23] Holman, C. *et al* (2014). *IAQM Guidance on the assessment of dust from demolition and construction*, Institute of Air Quality Management, London. www.iaqm.co.uk/ text/guidance/construction-dust-2014.pdf.

Potential effect	Distance	Rationale
Emissions to air – traffic emissions	200m from vehicle routes	Based on dispersion of NOx from vehicle emissions in accordance with IAQM advice[24] (para. 5.3.7)
Emissions to water	Variable	Sensitive receptors downstream of Proposed Development, or located within groundwater body or aquifer
Noise	Variable	Where noise-sensitive receptors occur in proximity to the Site, this can be defined by results of noise modelling - 55dB(A) can be regarded as limit of potential effects based on *Waterbird Disturbance Mitigation Toolkit*[25]
Lighting	Variable	Defined by results of lighting assessment - 1 lux development contribution at receptor can be regarded as limit of potential effects for most sensitive species
Human disturbance - activity on site	650m	Maximum disturbance distance for most sensitive species (curlew) based on NatureScot advice[26]
Recreational disturbance	Variable	Where recreational disturbance is identified as a pressure or threat, buffer zone used is based on recreational travel research in local area

European and Ramsar Sites within ZoI

Figure 1 shows the sites identified as requiring consideration in the HRA report, including those within 10km of the emission, and those downstream of the Proposed Development. They comprise the following sites, ordered in terms of distance from the Proposed Development - note the Ramsar sites include a number of multi-site designations within the 10km search radius, and some sites are both designated as a SAC and listed as a Ramsar Site. The location of the nearest 'downstream' site, River Dee SAC, is given the straight-line distance to the confluence of the sub-catchment draining the Site. This is located to the west of the village of Shocklach, Cheshire, and is at the point where the River Dee starts to form the border between Wales and England. The intervening watercourses from the Proposed Development to the SAC boundary are the Red Brook, Wych Brook and Worthenbury Brook (from OS 1:25000 map).

[24] Holman, C. *et al* (2020). *A guide to the assessment of air quality impacts on designated nature conservation sites* – version 1.1, Institute of Air Quality Management, London.
[25] Cutts, N, Hemingway, K and Spencer, J (2013). *Waterbird Disturbance Mitigation Toolkit Informing Estuarine Planning and Construction Projects*. Institute of Estuarine & Coastal Studies (IECS) University of Hull. Version 3.2.
[26] Goodship, N.M. and Furness, R.W. (2022) *Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species*. NatureScot Research Report 1283.

Table 3.2: European and Ramsar Sites

Site	Designation	Location (nearest boundary)	Distance from Site (km)
Fenn's, Whixall, Bettisfield, Wem and Cadney Mosses	SAC	350405, 338878	0.4
Midland Meres and Mosses Phase 2 (Fenn's Moss SAC)	Ramsar	350405, 338878	0.4
Midland Meres and Mosses Phase 2 (Llyn Bedydd SSSI)	Ramsar	347170, 330390	3.4
Midland Meres and Mosses Phase 2 (Hanmer Mere SSSI)	Ramsar	345600, 339320	5.0
Brown Moss	SAC	355950, 339320	5.3
Midland Meres and Mosses Phase 1 (Brown Moss SAC)	Ramsar	355950, 339320	5.3
Midland Meres and Mosses Phase 2 (Oss Mere SSSI)	Ramsar	356230, 343450	7.1
Midland Meres and Mosses Phase 1 (Quoisley Moss SSSI)	Ramsar	354580, 345280	7.3
West Midlands Mosses	SAC	343560, 334250	8.6
Midland Meres and Mosses Phase 1 (West Midlands Mosses SAC / Clarepool Moss SSSI)	Ramsar	343560, 334250	8.6
Midland Meres and Mosses Phase 2 (Cole Mere SSSI)	Ramsar	343800, 333370	9.0
Midland Meres and Mosses Phase 2 (Brownheath Moss SSSI)	Ramsar	345940, 330390	9.9
River Dee and Bala Lake	SAC	342330, 349380	13.2

SAC Qualifying Features

The tables below summarises the SAC qualifying features and Ramsar site selection criteria for sites within the 10km air quality ZoI and downstream catchment.

Table 3.3: SAC Qualifying Features

SAC Site	Qualifying Features	Additional SAC features not a primary reason for site selection
Fenn's, Whixall, Bettisfield, Wem and Cadney Mosses	Active raised bogs (Annex 1 priority habitat H7110)	Degraded raised bogs still capable of natural regeneration (Annex 1 habitat H7120)
Brown Moss	Floating water plantain *Luronium natans* (Annex 2 species S1831)	None

SAC Site	Qualifying Features	Additional SAC features not a primary reason for site selection
West Midlands Mosses	Natural dystrophic lakes and ponds (Annex 1 habitat H3160) Transition mires and quaking bogs (H7140)	None
River Dee and Bala Lake	Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation (Annex 1 habitat H3260) Atlantic salmon *Salmo salar* (Annex 2 species S1106) Floating water plantain *Luronium natans* (Annex 2 species S1831)	Sea lamprey *Petromyzon marinus* (Annex 2 species S1095) Brook lamprey *Lampetra planeri* (S1096) River lamprey *Lampetra fluviatilis* (S1099) Bullhead *Cottus gobio* (S1163) Otter (*Lutra lutra* S1355)

Fenn's, Whixall, Bettisfield, Wem and Cadney Mosses SAC is described in the NRW *Core Management Plan* as one of the largest and most southerly raised bogs in the UK. It states that although much of the site has been subject to peat extraction, areas of partially-cut and uncut mire still remain. In areas formerly subject to peat-cutting, recent conservation management is leading to the regeneration of bog-forming vegetation.

Brown Moss SAC is a 31.64ha site; it is described as an area of former heathland, now largely colonised by woodland, with a series of shallow pools. Floating water-plantain *Luronium natans* has been known to occur at Brown Moss for several years, and the site possibly represents a relict natural lowland population of the species[27].

West Midlands Mosses SAC is a composite site with a total area of 184.62ha, comprising four sites - Clarepool Moss (within the ZoI), Abbots Moss, Chartley Moss and Wybunbury Moss. It is described as supporting large basin mires which have developed as quaking bogs, known as 'schwingmoors', together with associated hollows and pools showing various types and stages of mire development, including raised bog on solid peat at two sites. This complexity of habitats gives rise to a diverse assemblage of associated plants and invertebrates of international significance[28].

River Dee and Bala Lake SAC is a 1309 hectare site, extending from its source at Bala Lake/Llyn Tegid downstream to the boundary with Dee Estuary SSSI; it takes in several tributaries, comprising the Ceiriog, Meloch, Tryweryn, and Mynach.

[27] https://sac.jncc.gov.uk/site/UK0030100

[28] Wood, A., Wake, H. and McKendrick-Smith, K. (2024). West Midland Mosses Special Area of Conservation – Evidence Pack Third Edition. *Natural England Technical Information Note* TIN206

Ramsar Site Selection Criteria

The relevant Ramsar Site selection criteria for the sites within the ZoI are:

Criterion 1: *Contains a representative, rare, or unique example of a natural or near-natural wetland type*; and

Criterion 2: *Supports vulnerable, endangered, or critically endangered species or threatened ecological communities*.

Table 3.4: Ramsar Site Selection Criteria

Ramsar Site	Selection Criteria	Detailed justification
Midland Meres and Mosses Phase 1	1	The site comprises a diverse range of habitats from open water to raised bog
	2	Supports a number of rare species of plants associated with wetlands including five nationally scarce species together with an assemblage of rare wetland invertebrates (three endangered insects and five other British Red Data Book species of invertebrates).
Midland Meres and Mosses Phase 2	1	The site comprises a diverse range of habitats from open water to raised bog
	2	Supports a number of rare species of plants associated with wetlands, including the nationally scarce cowbane *Cicuta virosa* and elongated sedge *Carex elongata*. Also present are the nationally scarce bryophytes *Dicranum affine* and *Sphagnum pulchrum*. Also supports an assemblage of invertebrates including several rare species. There are 16 species of British Red Data Book insect listed for this site including the following endangered species: the moth *Glyphipteryx lathamella*, the caddisfly *Hagenella clathrata* and the sawfly *Trichiosoma vitellinae*

Midland Meres and Mosses Phase 1 Ramsar Site comprises a total of 16 different sites in Shropshire and Cheshire, covering a total area of 511ha[29]. They are described as A series of lowland open water and peatland sites set in depressions in glacial drift left by receding ice sheets. Component sites include nutrient-rich water bodies (meres), associated fringing habitats of reed swamps, fen, carr and damp pasture, and floating quaking bog (Schwingmoor). The wide range of resulting habitats supports numerous rare species of plants and invertebrates.

Midland Meres and Mosses Phase 2 Ramsar Site comprises a total of 18 different sites extending across Shropshire, Cheshire and NE Wales, with a total area of 1588ha.[30]

[29] https://rsis.ramsar.org/ris/653
[30] https://rsis.ramsar.org/ris/891

They are described as comprising nutrient-rich open water bodies (meres) with fringing habitats of reed swamp, fen, carr and damp pasture, and peatlands.

4 Description of Proposed Development

4.1 Key Features of Proposed Development

Details of the Proposed Development are outlined in the *Planning, Design and Access Statement* (PDAS)[31], which should be referred to for further information if required.

The following summarises key features of relevance to the HRA, including its physical scale and location, transport requirements, and key technical features including waste throughput, key features of process, and emissions to air and water.

The Proposed Development is located on a ca. 5ha site, located on the former Befesa Salt Slag site. The nearest boundary of the Site is located approximately 185m to the north-east of the nearest boundary of a contiguous European and Ramsar site, Fenn's, Whixall, Bettisfield, Wem and Cadney Mosses SAC, and Midland Meres and Mosses Phase 2 Ramsar Site.

The Salt Slags operation recycled aluminium contained within waste product by producing aluminium alloys. Production ceased in 2020, but the operation still retains its planning consent and Environmental Permit for emissions to air and water.

The IVC would have a processing capacity of 50,000 tonnes per annum (tpa) of green and / or co-mingled food waste. The proportion of food waste to green waste is expected to vary seasonally, with food waste making up a higher proportion of inputs in the winter months. This has implications for generation of ammonia, which has been taken account of in dispersion modelling in the AQA ('Scenario 2'; see AQA, section 6.2.1 & Table 8).

Waste inputs and exported product would be transported to the site using existing road infrastructure. All traffic will come from the north, being routed via the A495, then east on the A545 to the A41. A total of 416 two-way HGV trips are forecast per week (i.e. <60 annual average daily trips), plus a total of 18 car journeys per day for the 9 staff. This routing does not pass within 200m of a European or Ramsar Site; the site access is over 350m from the boundary of the nearest SAC.

[31] Axis Ltd. (2025). *Proposed Development of an In-Vessel Composting (IVC) Facility, Former Befesa Salt Slags Site, Fenns Bank, Wrexham – Fenn's Bank IVC*. *Planning Design and Access Statement*. Ref. 5039-01-PDAS-07. September 2025.

4.2 Existing Structures

Structures on the Site have been maintained in a semi-restored state, and would be brought back in to use to accommodate the Proposed Development. They include the following:

- Main building - large industrial building 105m x 54m footprint, x 13m high;
- Office building; and
- Weighbridge complex including wheelwash.

There is also a car park on site which would be re-used, and an area of hardstanding adjoining the main building which would accommodate compost maturation bays.

An existing lagoon previously used for the water management system in the Salt Slags operation would be partly infilled to create a more natural pond with higher biodiversity value.

4.3 Construction Proposals

Most of the construction requirements of the Proposed Development involve re-purposing and re-utilisation of existing structures, and do not require significant external works.

New construction work within the existing development footprint will involve the following elements:

- Two new biofilter rooms located to the north of the main building, including a fan extraction system, and connected to the main building by a steel pipeline;
- A 27m stack connected to the biofilters (increased from 20m in initial design to avoid impacts at nearest SAC), located to the rear of the main building, 0.4km from the nearest boundary of the SAC;
- A compost stabilisation / maturation pad established on existing hard-standing, and consisting of 16 bays with a forced aeration system; and
- A refining plant consisting of a hopper and series of conveyors and screens, partly enclosed, and screened on 3 sides with a 5m-high noise attenuation fence or wall.

In addition to the above, changes to site boundaries will include replacement of an existing chain link fence with a 2.4m tall dark green Paladin security fence. Existing

vegetation would be retained insofar as possible, with additional planting around the boundary.

4.4 Site Drainage and Emissions to Water

Details of existing and proposed site drainage and water treatment / pollution prevention measures are set out in more detail in the *Site Drainage Strategy*, with further information in the *PDAS*. The following summarises key elements, including mitigation measures to avoid impacts on European sites.

Surface Water Drainage

The surface water management system will include 'clean' and 'process' water areas. Clean water areas comprise roofs, car park and roads, with a total area of 2.1ha. Water from these areas will drain into a dedicated surface water drainage system. Attenuation to greenfield discharge rates will be achieved by two tanks located between the car park and access road, and an open attenuation pond within a landscaped area to the north-west of the IVC facility, lined to prevent ingress of groundwater. Runoff from the site compound / building roofs will be diverted through one tank into the attenuation pond prior to discharge to surface waters; runoff from the car park and office roof will be diverted through the other tank into a proprietary water treatment (pollution separation) system prior to discharge. Surface water will be discharged to an unnamed watercourse ca. 240m north of the Site; this is a tributary of Red Brook, which is part of the River Dee catchment.

The 'process' water areas include the compost maturation pad and refining plant area. Rainwater and water used for dust suppression from these areas will be captured and conveyed to on-site storage tanks adjacent to the biofilters. The PDAS notes that this can then be either recycled for dust suppression control, or exported off-site by tankers for wastewater treatment.

Foul Water Drainage

The *Site Drainage Strategy* notes that the Befesa Salt Slag works previously employed 56 staff, which would have resulted in significantly greater phosphate discharges to watercourses than the 9 staff to be employed by the Proposed Development.

The existing sewage treatment plant will be replaced by a treatment system more suited to the smaller number of employees. The report notes that this can be fitted with a biological phosphate reduction system to achieve final effluent concentrations

of 0.2mg/l. This will then be conveyed off-site to surface waters via the 600mm discharge pipe.

In HRA terms, a phosphate reduction system could be regarded as additional mitigation to avoid impacts on downstream European sites.

4.5 Emissions to Air

The AQA confirms that the only pollutant of potential ecological concern is ammonia (NH_3), which would be emitted from the biofilter stack.

Section 6 of the AQA sets out the technical parameters of the biofilter stack and flue gas. This notes that emission limit values (ELVs) for ammonia are taken from the Waste Treatment Best Available Techniques Reference (BREF) document. The upper end of the BAT associated emission level (BAT-AEL) is 20 mg/m³. However, following preliminary modelling, it was determined that the ammonia ELV would need to be set lower. The technology provider has confirmed that an ELV of 3.5 mg/m^3 can be achieved, and this has been used in the dispersion model.

It is important to note that the ammonia generating potential varies with source material, being higher for food waste and lower for green waste. Two scenarios have been modelled: Scenario 1 is 'worst case', assuming a high proportion of year-round food waste; Scenario 2 is a realistic scenario, based on a higher proportion of green waste in summer, and intermediate values in spring and autumn (AQA Table 8). For the purposes of the HRA the 'realistic' scenario accords with the precautionary principle, and modelling based on this scenario has been used to assess potential effects on European and Ramsar Sites.

The AQA (section 7 - Sensitivity Analysis) describes the Stack Height Assessment process, which uses the closest sensitive qualifying feature of a European or Ramsar site (degraded raised bog habitat) to determine an appropriate stack height. Graph 3 shows the annual mean ammonia impact at bog habitat, with a 27m stack giving a process contribution of no more than 1% of critical level at the edge of this area.

In HRA terms, it is important to note that the reduction in the ammonia ELV below the BAT-AEL to 3.5 mg/m^3, and the increase in stack height to 27m are both mitigation measures designed to avoid significant effects on European and Ramsar Sites.

5 Assessment of Likely Significant Effect

5.1 Necessity for conservation of European Sites?

The purpose of the Proposed Development is not directly concerned with or necessary for the management of the European or Ramsar sites, and therefore cannot be screened out from the potential requirement for Appropriate Assessment on those grounds.

5.2 Initial screening assessment

The following screening assessments address the potential of the Proposed Development to have a likely significant effect alone, prior to consideration of potential in-combination effects. Having regard to the maximum potential Zones of Influence (ZoI) set out above in Table 3.1, the following table identifies the sites which could potentially be affected by different impacts, allowing exclusion of those with no risk of resulting likely significant effect from those requiring more detailed screening or consideration at Appropriate Assessment stage.

Table 5.1: Initial screening

Potential effect	Fenn's, Whixall, Bettisfield, Wem and Cadney Mosses SAC	Brown Moss SAC	West Midlands Mosses SAC	River Dee and Bala Lake SAC	Midland Meres & Mosses Phase 1 Ramsar	Midland Meres & Mosses Phase 2 Ramsar
Land-take	X	X	X	X	X	X
Loss of functionally linked land	X	X	X	X	X	X
Emissions to air - dust	X	X	X	X	X	X
Emissions to air - stack emissions	✔	X	X	X	X	✔
Emissions to air – traffic emissions	X	X	X	X	X	X
Emissions to water - surface water drainage	✔	X	X	✔	X	✔
Emissions to water - foul water drainage	X	X	X	✔	X	X

Potential effect	Fenn's, Whixall, Bettisfield, Wem and Cadney Mosses SAC	Brown Moss SAC	West Midlands Mosses SAC	River Dee and Bala Lake SAC	Midland Meres & Mosses Phase 1 Ramsar	Midland Meres & Mosses Phase 2 Ramsar
Noise	X	X	X	X	X	X
Lighting	X	X	X	X	X	X
Human disturbance - activity on site	X	X	X	X	X	X
Recreational disturbance	X	X	X	X	X	X

Impacts screened out from further consideration

The following potential impacts can be readily screened out from further consideration, as not representing a feasible pathway to give rise to a likely significant effect.

Land-take

The Site is not located within a statutory designated site, and neither the Proposed Development nor any ancillary works are required to take place within any of the designated sites.

Loss of functionally linked land

Functionally linked land' (FLL) is defined as areas of land or sea occurring outside a designated site which is considered to be critical to, or necessary for, the ecological or behavioural functions in a relevant season of a qualifying feature for which the European or Ramsar site has been designated[32].

None of the qualifying features of the proximal Fenn's Moss SAC / Midland Meres and Mosses Phase 2 Ramsar are dependent on FLL outside the designated site; there are no qualifying features of any other European or Ramsar Sites that are potentially dependent on functionally linked land in the vicinity of the Proposed Development.

Emissions to air - dust

The Proposed Development is 185m from the nearest designated site boundary, outside of the IAQM 50m screening distance for dust impacts on designated sites (see Table 3.1 above and *AQA Addendum* section 2.2, and more than 200m from where potentially dust-generating activities will occur. Given the lack of demolition work and

[32] Bowland Ecology (2021). *Identification of Functionally Linked Land supporting SPA waterbirds in the North West of England*. Natural England Commissioned Report NERC361.

limited extent of excavation and construction work, the dust generating potential of the Proposed Development is assessed as 'small'.

Emissions to air - traffic emissions

The Proposed Development does not involve any traffic movements within 200m of a designated site (see Table 3.1 and Section 4 Description of Development above). Both construction and operation phase traffic movements are below the assessment thresholds, and can be considered negligible (see AQA Addendum, sections 2.1 & 3.1).

Noise

Qualifying features of the nearest European and Ramsar Site are not considered noise-sensitive.

Lighting

Qualifying features of the nearest European and Ramsar Site are not considered noise-sensitive to light spillage.

Human disturbance - activity on site

Qualifying features of the nearest European and Ramsar Site are not considered disturbance-sensitive.

Human disturbance - recreational activity

As an industrial facility with an intended staffing level of 9, the potential for generating additional recreational pressure is negligible, compared to residential and leisure developments. The short construction period can be considered inconsequential.

5.2 Assessment of Likely Significant Effect

Introduction

Three potential effects require further screening to determine likely significant effect - emissions to air (stack emissions) and emissions to water (surface and contaminated water). In accordance with *Waddenzee* principles, the assessment of likely significant effect (ALSE) should be a relatively simple screening process - any effect requiring more detailed analysis and evaluation should be taken forward for Appropriate Assessment.

The ALSE set out below considers three different outcomes:

- the ALSE can conclude 'no likely significant effect', and the risk or predicted magnitude of effect is either non-existent or so low as to be inconsequential or

de minimis, incapable of acting in a cumulative or in-combination manner with other plans or projects; or

- the ALSE can conclude 'no likely significant effect' alone on the basis of low risk of occurrence or low magnitude of impact, but there is a potential for cumulative or in-combination effects with other plans or projects; or
- it is not possible to conclude 'no likely significant effect', either because the effects are uncertain, the magnitude or risk of effect may be significant, or additional mitigation is required; in this case further Appropriate Assessment will be undertaken, without the need to consider in-combination effects at this stage.

With respect to the third outcome, it should be noted that mitigation measures specifically designed to address likely significant effects can be regarded as 'additional', and require consideration at Appropriate Assessment stage. This is based on case law (*People over Wind*) and subsequent guidance (see Section 2.3 above).

Following initial screening, three potential impacts require further screening for likely significant effect:

- Impacts of surface water drainage on Fenn's, Whixall, Bettisfield, Wem and Cadney Mosses SAC, Midland Meres and Mosses Ramsar Site, and River Dee and Bala Lake SAC;
- Impacts of foul water drainage on River Dee and Bala Lake SAC; and
- Impacts of ammonia emissions on Fenn's, Whixall, Bettisfield, Wem and Cadney Mosses SAC, and Midland Meres and Mosses Ramsar Site.

Impacts of Surface Water Drainage

In their pre-application consultation response, NRW touch upon the issue of pollution prevention in the SAC and Ramsar site, referring to the sections of their response concerning contaminated land and pollution of controlled waters.

NRW raise the potential issue of surface water contamination due to contaminated land in the vicinity of the Proposed Development, on an adjacent closed landfill site and potentially within the Site itself. They require a water treatment solution which does not result in contamination of surface waters, and which conforms to Sustainable Drainage Systems (SuDS) standards. The *Drainage Strategy* describes how this will be achieved (see also summary in Section 3 above), by a combination of an attenuation

pond, and two storage tanks with a proprietary treatment system to remove coarse sediment, debris and free-floating oil from surface water runoff. These would be sealed, with no pathway for contaminated groundwater ingress. Process water would remain separate from this system, and be either recycled or removed by tanker for treatment.

The drainage design and water pollution avoidance measures set out in the *Drainage Strategy* are necessary to comply with relevant legislation and policy such as SuDS, would be implemented irrespective of the presence of proximal and downstream designated sites, and can be regarded as incorporated mitigation integral to the design of the Proposed Development. As such they cannot be regarded as additional mitigation in accordance with *People over Wind*, and it can be concluded that there would be **no likely significant effect** on any European or Ramsar site as a consequence of surface water pollution.

Impacts of foul water drainage

NRW raised the issue of phosphate levels and nutrient neutrality requirements in the River Dee SAC catchment, referring to their *Advice to planning authorities for planning applications affecting nutrient sensitive Special Areas of Conservation*[33]. The *Drainage Strategy* took this advice into account, noting the reduction of staff compared to the currently permitted discharge, and proposing a phosphate treatment plant.

The reduction in staff from the currently permitted development could be regarded as creating sufficient 'headroom', as allowed by European case law (see *Netherlands Ammonia Cases* - (referred to as the *Dutch Nitrogen Cases* in nutrient sensitive catchment advice)), and a small industrial development with few staff does not fall within the range of projects usually required to achieve nutrient neutrality under NRWs advice. However, as the proposed phosphate treatment plant could be regarded as additional mitigation in the sense of *People over Wind*, it may be necessary to conclude **likely significant effect** and consider the issue in greater detail at Appropriate Assessment stage. This allows for more detailed consideration of the condition and nutrient pressures affecting the SAC, NRW guidance on nutrient-sensitive SACs, and the requirements for phosphate reduction or other mitigation measures.

[33] https://naturalresourceswales.gov.uk/guidance-and-advice/business-sectors/planning-and-development/advice-for-planning-authorities/advice-to-planning-authorities-for-planning-applications-affecting-phosphorus-sensitive-special-areas-of-conservation/?lang=en (Version 5.1, 22/10/2025)

Impacts of ammonia emissions

In the absence of mitigation measures, the process contribution (PC) to ammonia would exceed 1% of the appropriate critical level (1 μg/m^3) for bog habitats at Fenn's Moss SAC / Ramsar Site. As monitored and modelled annual mean background levels currently exceed 1 μg/m^3, this would be regarded as a likely significant effect.

Two mitigation measures are proposed which would ensure the PC was below 1% of critical level at the nearest part of the SAC capable of restoration to bog habitat - reduction of ammonia ELV below the BAT-AEL to 3.5 mg/m^3, and the increase in stack height from 20m to 27m. In accordance with *People over Wind*, these require consideration at Appropriate Assessment stage, and it is necessary to conclude **likely significant effect**.

Note that no other air quality parameters, including nitrogen and acid deposition, exceed 1% of critical load in any part of Fenn's Moss SAC / Ramsar Site.

5.7 In-Combination Effects

Searches and consultations have been undertaken for new and proposed projects which could contribute to in-combination effects on European and Ramsar Sites.

The only development identified is the Whitchurch Biogas Ltd Anaerobic Digestion (AD) Plant (14/01398/MAW) located on the A525 approximately 5 km east of the Facility. This has been operational since approximately 2016 so any contribution it makes to ammonia concentrations and acid and nitrogen deposition will be in the background data used to inform the assessment and an in-combination assessment is not required for this development. As such, no potentially significant new or planned sources of ammonia or nitrogen deposition have been identified within 5 km of the Facility, so an in-combination assessment is not required.

It should be further noted, in considering the source attribution of emissions contributing to baseline pollutant levels and deposition rates, the AQA took account of existing unregulated activities and operational consents. With respect to water quality in the River Dee SAC, existing unregulated activities and operational consents are also taken account of in baseline monitoring data, and assessments of site condition and nutrient pollution issues.

6 Information to Inform Appropriate Assessment

6.1 Scope of assessment

Likely significant effects

The following impacts cannot be screened out from having a likely significant effect on European and Ramsar Sites, in the absence of incorporated or additional mitigation measures:

- Foul water drainage on River Dee and Bala Lake SAC; and
- Ammonia emissions on Fenn's, Whixall, Bettisfield, Wem and Cadney Mosses SAC, and Midland Meres and Mosses Phase 2 Ramsar Site;

No likely significant effects have been identified on any of the other European or Ramsar sites considered within the potential Zone of Influence of the Proposed Development. As the Ramsar Site Selection Criteria comprise raised bog, and plants / invertebrates dependent on bog habitat, consideration of impacts on the SAC will adequately address those on the Ramsar Site.

At Appropriate Assessment stage, it is legitimate to consider mitigation measures, including those already embedded in the development or committed to in the Planning Statement, and if necessary to put forward additional mitigation measures which would ensure avoidance of an effect on site integrity.

6.2 Site Integrity

The integrity of a European site is defined in England and Wales as '*the coherence of its ecological structure and function across its whole area, that enables it to sustain the habitat, complex of habitats and / or the levels of populations of the species for which the site is designated.*'

In order to avoid an adverse effect on integrity, the conservation status of a habitat must, if favourable, be preserved and, if unfavourable, must not be further harmed or rendered more difficult to restore to a favourable status.

The integrity of a site is assessed in relation to its conservation objectives; a negative effect is not an adverse effect on integrity if it would not undermine the site's conservation objectives, alone or in combination with other plans or projects.

6.3 Conservation Objectives, Attributes and Targets - River Dee and Bala Lake SAC

Conservation Objectives and Attributes

As the River Dee SAC includes both Welsh and English reaches and tributaries, it is relevant to consider both Welsh (NRW) and English (Natural England) advice with respect to Conservation Objectives, site condition and pressures. Drainage from the Proposed Development reaches the SAC at a point where it forms the national border, whilst lower reaches are wholly within England, so Natural England advice is more relevant. In these reaches there are two relevant qualifying features - H3260 water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation, and S1106 Atlantic salmon.

Natural England's *Supplementary Advice for Conservation Objectives* (SACOs)[34] identifies a series of attributes which contribute to the site's ecological integrity.

The following attribute is relevant for assessing the effects of water quality impacts on site integrity, with reference to the relevant qualifying features on water courses of plain to montane levels qualifying feature:

- Supporting processes: water quality - nutrients;
- Supporting processes: water quality - nutrient pollution;

The following attribute is relevant for Atlantic salmon:

- Supporting habitat structure / function: water quality - nutrients.

These attributes relate in turn to two of the SACs generic Conservation Objectives, which are to maintain or restore:

- **The structure and function of the habitats of qualifying species**; and
- **The supporting processes on which qualifying natural habitats and the habitats of the qualifying features rely.**

[34] Natural England (2019). *European Site Conservation Objectives: Supplementary advice on conserving and restoring site features. River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid Special Area of Conservation (SAC)* Site Code: UK0030252.

Attribute Targets

Table 6.1: Attribute Targets - River Dee and Bala Lake SAC

Attribute	Target
Qualifying feature: water courses of plain to montane levels	
Supporting processes: water quality - nutrients	Restore the natural nutrient regime of the river, with any anthropogenic enrichment above natural/background concentrations limited to levels at which adverse effects on the features are unlikely
Qualifying feature: Atlantic salmon	
Supporting habitat structure / function: water quality - nutrients	See general advice for river habitat (H3260).

Supplementary information for each target in the SACO is given below:

Table 6.2: Supporting Information for Targets

Attribute	Supporting Information
Qualifying feature: water courses of plain to montane levels	
Supporting processes: water quality - nutrients	Elevated nutrient levels interfere with competitive interactions between higher plant species and between higher plants and algae, leading to dominance by attached forms of algae and a loss of characteristic plant species (which may include lower plants such as mosses and liverworts). Through changes to plant growth and plant community composition and structure they also affect the wider food web, altering the balance between species with different feeding and behavioural strategies. The respiration of artificially large growths of benthic or floating algae may generate large diurnal sags in dissolved oxygen and poor substrate conditions (increased siltation) for fish and invertebrate species. The management focus is typically on phosphorus in rivers, on the assumption that it can be more easily controlled at levels that limit the growth of plant species. However, nitrogen may also be important in river eutrophication and ideally co-limitation would be the management aim. Large areas of these catchments are not connected to the foul sewer network, and the many private treatment systems are a mix of biological treatment systems and septic tanks to soakaway; some septic tanks discharge direct to watercourses. Poor agricultural land management practices can also be a factor e.g. general agricultural runoff, land-spreading activities, wastewater management. SAGIS modelling was undertaken across the Dee catchment to identify the relative contributions made by different sectors, with respect to nutrient loading. Some catchments are dominated by agricultural inputs, particularly from livestock areas e.g. Aldford, Henlake, Worthenbury lower and middle, as well as the Emral and Clywedog catchment. Others e.g. Pulford, Worthenbury, Upper, Wych and the main Dee are dominated by loading from point source, sewage discharges The most significant contribution to phosphorous loading in the lower Dee is from STWs, notably Five Fords and Huntington. SAGIS concluded that the River Alyn (Mold STW) and Pulford Brook (Pulford Brook STW) were significant sources of phosphorus to the River Dee Current annual mean SRP concentrations are within the water quality target in the upstream reaches of the Dee SSSI/SAC at all monitoring locations and almost double the target concentration in downstream reaches.
Qualifying feature: Atlantic salmon	
Supporting habitat structure / function: Water quality - nutrients	In addition to the wider ecosystem effects of eutrophication that have a detrimental effect on salmon habitat, enrichment can place salmon at a competitive disadvantage, for instance relative to brown trout. Salmon are efficient foragers that are adapted to low productivity environments, and increased productivity makes efficient foraging obsolete. Eutrophication and episodic pollution causes direct mortalities, whilst

Attribute	Supporting Information
	chronic pollution affects substrate condition through the build-up of excessive microbial populations. Salmon are particularly sensitive to reduce dissolved oxygen levels, in the water column and within the gravel substrate of spawning redds (nests).

The Supplementary Advice states: '*The targets given for each attribute do not represent thresholds to assess the significance of any given impact in Habitats Regulation Assessments. You will need to assess this on a case-by-case basis using the most current information available*.'

The question of whether an impact is 'significant' in the context of an Appropriate Assessment can be understood in terms of whether it is capable of undermining the site's Conservation Objectives. This requires assessment of impacts against each of the relevant qualifying features, having regard for the site-specific advice in the SACO. It is pertinent to consider whether the current conservation status of each feature, and its sensitivity to the relevant impact. In the case of nutrient pollution, the SAC is in unfavourable condition with respect to phosphate levels, and the target is to 'restore' rather than maintain.

6.4 Conservation Objectives - Fenn's, Whixall, Bettisfield, Wem and Cadney Mosses SAC

Introduction

As the SAC is a cross-border site, information on Conservation Objectives is available from both NRW and Natural England. However, as the Proposed Development, and the potential effects of ammonia dispersion are located wholly within Wales, it is more appropriate to refer to NRWs *Core Management Plan and Conservation Objectives*, rather than Natural England's SACOs[35]. As this was published in 2009, it is also necessary to refer to more recent trends in air quality, measures taken to improve site condition, and measures taken to reduce nitrogenous pollutants in the vicinity of the SAC.

Conservation Objectives and Performance Indicators

The Conservation Objectives set out in the *Core Management Plan* pre-date the adoption by NRW of the attribute - target structure used in more recent plans[36], which are similar to Natural England's SACOs. The Conservation Objectives instead contain

[35] Natural England (2017). *European Site Conservation Objectives: Supplementary advice on conserving and restoring site features. Fenn's, Whixall, Bettisfield, Wem & Cadney Mosses Special Area of Conservation (SAC)* Site Code: UK0012912. 22 August 2017.

[36] Natural Resources Wales (2025). *Ardal Cadwraeth Arbennig Pen Llŷn a'r Sarnau / Lleyn Peninsula and the Sarnau Special Area of Conservation Advice provided by Natural Resources Wales in fulfilment of Regulation 37(3) of the Conservation of Habitats and Species Regulations 2017*. June 2025.

two elements - a **vision for the feature**, and **performance indicators**. The vision for the feature (Active Raised Bog habitat) comprises a list of conditions for the site which, when all were met, would ensure the feature was in a favourable conservation status. These include conditions relating to species composition (e.g. high cover of *Sphagnum*; absence of negative indicator species), management (e.g. absence of burning; diversion of nutrient rich drains away from bog surface; low intensity agriculture in surroundings) and function (e.g. restoration of active peat building). Performance Indicators are divided into measurable attributes of feature condition, with specified limits to define favourable condition, and indicators for factors affecting the condition, with operational limits defined where possible for each factor.

Atmospheric deposition is defined as a factor affecting condition, with information sources from Air Pollution Information Service (APIS) on critical loads for acid and nitrogen deposition, but no operational limit defined. Ammonia levels are not identified as a factor affecting the feature. The more recent (2017) SACOs for the English side of the SAC have an air quality attribute target to *'Restore the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for the H7110 feature of the site on the Air Pollution Information System*.' In the case of ammonia, due to the importance of sensitive lower plants like *Sphagnum* moss and *Cladonia* lichens to active raised bog habitat, the critical level is set by APIS at the lower 1μg/m^3 annual mean.

Feature Condition

Details of SAC and SSSI feature condition are given in the *Ecological Interpretation of AQA*. The following extract from NRWs 2020 Baseline Evaluation spreadsheet gives the indicative condition of the two SAC features as 'unfavourable':

Table 6.2: NRW Feature Condition Assessment

Feature	Indicative condition	Evidence quality
Active raised bogs	Unfavourable	High
Degraded raised bogs	Unfavourable	High

The Ecological Interpretation notes that the reasons cited for unfavourable condition include the following[37]:

- Drainage associated with past peat cutting;
- Loss of interface between bog and surrounding land to agriculture and forestry;
- Ingress of nutrient-rich water from surrounding agricultural land resulting from canalised drain linkages; and
- Atmospheric nitrogen deposition, with agricultural activities within 5km of the site resulting in over half of emissions.

It is clear that the major changes in land-use in the past have the greatest responsibility for the site's current unfavourable condition. Nitrogenous pollutants are cited as a current factor, with excessive growth of birch *Betula* spp. and *Molinia* coupled with difficulties in establishing *Sphagnum* cited as consequences of elevated nutrient status.

APIS modelled background nitrogen deposition rates across the site range from 21.3-22.7kg N/ha/yr (2021 mid-year (2020-22) data), well above the 5kg N/ha/yr critical load for bog habitats, and modelled background ammonia levels across the site range from 2.9 - 3.2μg/m^3; these are all at a 1km grid square scale of resolution.

Ammonia data cited in Duff, 2023 from the EU BogLIFE monitoring project in 2018 showed average values of 2.64, 6.15 and 3.28μg/m^3 for three passive diffusion samplers located within the site[38]. All these values are well above the 1.0μg/m^3 critical level for habitats containing important lower plant communities such as bogs, and some were above the upper 3.0μg/m^3 level for protection of ecosystems.

[37] Duff, R. (2023), *"The Marches Mosses BogLIFE project: putting nature-based solutions into practice"*, *Project Repository Journal*, 16, pp.62-71. Available at https://www.europeandissemination.eu/article/the-marches-mosses-boglife-project-putting-nature-based-solutions-into-practice/19780. (Accessed: 06 Aug 2025)

[38] Tang, S.; Stephens, A.; Keenan, P.O.; Binoti, T.; Duff, R. (2019). *Ammonia measurements from passive samplers at Fenn's, Whixall, Wem & Cadney Mosses SAC (2018).* NERC Environmental Information Data Centre. https://doi.org/10.5285/c6145da7-ec61-49ae-a050-f5c5acd6cf9e

Trends in Ammonia Levels

The AQA (table 4) reports the more recent results of ammonia concentrations on Fenn's Moss, measured by a passive diffusion sampler forming part of the UKEAP National Ammonia Monitoring Network, and located in the central part of the bog at OS grid ref. 348873, 336488. This shows a declining trend in annual mean values from 2020 - 2024 of 2.67 - 1.88μg/m^3, an annual average reduction over four years of almost 0.2μg/m^3.

The *Ecological Interpretation* notes that this declining trend may be attributed to mitigation measures to control local agricultural emissions undertaken through the Shared Nitrogen Action Plan (SNAP) and Catchment Sensitive Farming programme. Monitored values at the centre of the bog are significantly lower than modelled values at a 1km^2 scale of resolution; the *Ecological Interpretation* suggests this could also be aided by the protective, scavenging effect of woodlands around the periphery of the bog surface.

6.5 Effect of Foul Water Drainage

Predicted Effects on River Dee and Bala Lake SAC

There is no risk that a small discharge from a 9-person treatment system would have an impact on phosphate levels in the River Dee to a degree likely to affect the target of achieving a return to natural nutrient levels. However, in accordance with nutrient neutrality requirements for nutrient-sensitive catchments, it is necessary to determine if mitigation measures are necessary for a development of this scale and type.

Requirement for Mitigation

NRWs *Principles of nutrient neutrality in relation to development or water discharge permit proposals*[39] web page sets out the key principles of nutrient neutrality measures, as minimising or eliminating the amount of nutrient generated by a development. Nutrient balance calculations are completed to determine how much nutrient could enter the water environment because of the development or water discharge permit proposal, compared with the existing site operation or land use.

[39] https://naturalresources.wales/guidance-and-advice/business-sectors/planning-and-development/advice-for-planning-authorities/principles-of-nutrient-neutrality-in-relation-to-development-or-water-discharge-permit-proposals/?lang=en

More detailed advice is given in NRWs *Advice to planning authorities for planning applications affecting nutrient sensitive Special Areas of Conservation* web page[40]. This identifies the type of developments which can be screened out as not likely to have a significant effect on a nutrient-sensitive river SAC; they include (but are not limited to):

- *any development that improves existing water quality discharges by reducing the nutrient concentration of wastewater without increasing volume or by decreasing the volume of wastewater produced without increasing the concentration of nutrients*
- *developments intended to provide services, facilities, commercial sites, or places of employment (e.g., community buildings, schools etc.) for a local population already served by residential connections to existing public or private sewers discharging within the SAC river catchment*.

With regard to the first point, in the case of the Proposed Development, as noted in the *Drainage Strategy*, an existing discharge permit or exemption allows discharge of effluent from a treatment system designed for a greater number of people, albeit one that is not currently in use. In HRA terms, cessation of this use can be regarded as creating 'headroom', allowing a smaller volume discharge to be permitted, which represents an improvement.

The second point relates to the nature of the development as an industrial site, whose employees are likely to live within the wider River Dee catchment, and utilise residential connections by public and private sewers connected to the SAC. This is clarified in the NRW Advice page by answers to the question *'What types of non-residential development lead to an increase in discharges?*' This is answered as including *'developments expected to serve a population from outside of an SAC catchment who are not already served by residential connections to existing public or private sewers discharging within the SAC river catchment. This includes, but is not limited to, self-service and serviced tourist accommodation such as hotels, guest houses, bed and breakfasts, self-catering holiday facilities, camping and caravan sites. There may be cases where planning applications for new commercial or industrial developments, such as conference facilities, large retail sites or major tourist attractions*

[40] https://naturalresourceswales.gov.uk/guidance-and-advice/business-sectors/planning-and-development/advice-for-planning-authorities/advice-to-planning-authorities-for-planning-applications-affecting-phosphorus-sensitive-special-areas-of-conservation/?lang=en

could result in the release of additional nutrients into the river system.' The Proposed Development does not fall into any of these categories, is not designed to serve a population living outside of the River Dee SAC catchment, and could therefore have been screened out as not having a likely significant effect, except for the fact that mitigation measures have been proposed.

Mitigation Proposals

Based on the above guidance, mitigation through installation of an additional phosphate reduction system is **not** required for the Proposed Development.

It should be noted that the NRW Advice expresses scepticism about the value of phosphate reduction systems on private treatment facilities, and does not advocate their use as a mitigation measure. This is primarily due to the additional maintenance requirements for chemical dosing, and risk of contamination if maintenance procedures are not followed rigorously.

The system proposed in the *Drainage Strategy* (Marsh Ensign phosphate module) is stated as being capable of achieving a 2mg/l phosphate concentration in effluent. Commercial literature for this product ('Phos-Lite module')[41] suggests that 2mg/l **total phosphorus** (TP) could actually be achieved, using an adsorption process which does not require chemical dosing; as such, this may address NRW concerns. Given that the default concentration for wastewater treatment works used in nutrient budget calculations are between 5-8mg TP/l[42], this would represent an enhancement measure relative to the domestic sewer connections of potential employees.

6.6 Effect of Ammonia Emissions

Requirement for Mitigation

Dispersion modelling and stack height assessment (see above and AQA) has already determined the necessity of avoiding a likely significant effect through reduction of the ammonia ELV below the BAT-AEL to 3.5 mg/m^3, and an increase in stack height from 20m to 27m.

Impact on SAC / Ramsar Site qualifying features

Under 'worst-case' meteorological data and realistic ('Scenario 2') assumptions about feedstock, the 1% PC / 0.01μg/m^3 modelled contour for ammonia levels (AQA Figure 7

[41] Marsh Industries (2025). *Phosphate and Nitrate Reduction from Marsh Industries*. Ref. MI/NE2025.
[42] Ricardo (2024). *Nutrient Budget Calculator - FAQs.* Report for Welsh Government. Issue 1.1, 10/09/2024.

- Ammonia levels - ecology) does not overlap any part of the SAC capable of restoration to qualifying raised bog habitat. This is based on modelling point E10 in the AQA, which abuts an area of bunded peat which currently supports birch and willow regeneration, but which can be regarded as capable of restoration to support active raised bog. Areas within the 1% contour consist of a narrow northward extension of the SAC boundary supporting hedgerows with trees and neutral grassland habitat, and a small area of agriculturally improved grassland at the outer edge of the peat basin, adjoining a farm steading.

When 5 year average meteorological data are applied, (AQA Tables 20 & 27), the ammonia PC at point E1 at the nearest edge of the SAC is reduced to 0.0079μg/m^3 (0.79% of 1.0μg/m^3 critical level), and the PC at point E10 is reduced to 0.0062μg/m^3 (0.62% of 1.0μg/m^3 critical level). Application of 5-year average meteorological data can be justified at detailed assessment stage to assess likely long-term effects of nutrient nitrogen, as eutrophication impacts are cumulative.

In the absence of in-combination impacts, an impact below 1% of the critical level for ammonia can be regarded as inconsequential or *de minimis* in HRA terms. It will not contribute in a significant manner to the current unfavourable condition of raised bog habitat, nor will it impede the return to favourable conservation status of this feature. There would therefore be no effect on the integrity of the SAC as a consequence of ammonia emissions.

6.7 In-combination Effects

No additional in-combination effects have been identified which require consideration at Appropriate Assessment stage.

7 Conclusions

7.1 HRA Stage 1 - Assessment of Likely Significant Effect

The information to inform a screening assessment has concluded that there would be no likely significant effect on any European or Ramsar Site due to land-take, direct impacts on supporting habitat, or on human disturbance impacts including noise, lighting or visual disturbance.

Control of emissions to surface water will be subject to a number of mitigation measures, some of which could be regarded as intrinsic to the design of the Proposed Development, while others would be required in terms of legislation and guidance irrespective of the presence of hydrologically connected European sites. The measures for surface water management set out in the *Drainage Strategy* have been assessed as having no likely significant effect on European or Ramsar Sites.

The *Drainage Strategy* proposed a possible reduction in phosphate emissions in foul water drainage to improve effluent quality reaching River Dee and Bala Lake SAC. This can be regarded as additional mitigation in accordance with *People over Wind*. The requirement for this mitigation, and compliance of the Proposed Development with nutrient neutrality requirements was therefore assessed at Appropriate Assessment stage; it was not possible to conclude 'no likely significant effect'.

The AQA included measures explicitly designed to reduce ammonia emissions to levels which would avoid impacts on sensitive bog habitats in Fenn's, Whixall, Bettisfield, Wem and Cadney Mosses SAC, and Midland Meres and Mosses Phase 2 Ramsar Site. As such, in accordance with *People over Wind*, these were considered in Appropriate Assessment stage, as it was not possible to conclude 'no likely significant effect' in the absence of mitigation.

No other plans or projects were identified which could result in a likely significant in-combination effect.

7.2 HRA Stage 2 - Appropriate Assessment

The information to inform an Appropriate Assessment included more detailed consideration of the impact of foul water emissions on River Dee and Bala Lake SAC. Due to the location of the input to the SAC on the English border, Natural England's Conservation Objectives, Attributes and Targets provided the appropriate framework for consideration of effects on site integrity. However, Welsh Government guidance was relevant for consideration of nutrient neutrality requirements. Because of the

existing discharge consent coupled with the nature and scale of the Proposed Development, guidance indicates that it falls outside the requirement for mitigation to achieve nutrient neutrality targets, and there would be no likely significant effect (and by extension, no effect on site integrity) as a consequence of foul water discharges. The addition of a phosphate treatment unit should be regarded as an optional enhancement measure, preferably subject to further consultation with NRW to determine if the proposed technology is acceptable.

The Information to Inform an Appropriate Assessment also considered the impacts of ammonia emissions on Fenn's, Whixall, Bettisfield, Wem and Cadney Mosses SAC. The Ramsar Site was not considered separately due to the equivalent sensitivity to ammonia of its features. This included consideration of existing mitigation measures implemented by NRW / Natural England, and their apparent positive effect on trends in ammonia levels on the raised bog habitat.

Following consideration of mitigation measures, modelled concentrations of ammonia emissions will remain below the 1% screening threshold on all areas of the SAC and Ramsar Site capable of supporting raised bog vegetation, and can be regarded as inconsequential or *de minimis*. When 5-year average meteorological data are considered, ammonia emissions from the Proposed Development would remain below the 1% screening threshold on all parts of the SAC and Ramsar Site.

No additional in-combination effects have been identified which would have required consideration at Appropriate Assessment stage.

7.3 The Integrity Test

The integrity of a site is defined in England and Wales as 'the coherence of its ecological structure and function across its whole area, that enables it to sustain the habitat, complex of habitats and / or the levels of populations of the species for which the site is designated.'

This assessment has shown that the Proposed Development will not adversely affect the Conservation Objectives of European or Ramsar sites, or their component attributes and targets, alone or in combination with other plans and projects. The Competent Authority is therefore invited to conclude that there will be no adverse effect on site integrity.

Appendix 1: Figures

Fig.1: European and Ramsar Sites (within 10km of Proposed Development)

